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10/813,472	03/30/2004	Yolanda Pricto	CM02768J	4787

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EXAMINER	
STOFFREGEN, JOEL	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/813,472	PRIETO ET AL.
	Examiner	Art Unit
	Joel Stoffregen	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the original application filed on 03/30/2004.

2. Claims 1-33 are currently pending in this application. Claims 1, 12, 20, 22, 23, 25, 27, 28, 29, 31, and 33 are independent claims.

Claim Objections

3. **Claims 6, 7, and 8** are objected to because of the following informalities: the claims refer to "a predictor". It is unclear which predictor the claims refer to. The claims should be changed to "the predictor". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-7 and 20** are rejected under 35 U.S.C. 102(b) as being anticipated by Ono, Patent No.: US 5,883,978 ("ONO").

6. Regarding **claim 1**, ONO teaches an encoder for encoding an input data signal comprising:

an analysis filter bank to decorrelate an input data signal (see FIG. 14, a filter bank for wavelet conversion);

a plurality of decimators to down sample the filtered input data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data); and

a predictor to extract cross-subband dependence ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

7. Regarding **claim 2**, ONO further teaches that the analysis filter bank includes a multi-level filter bank (see FIG. 14).

8. Regarding **claim 3**, ONO further teaches that the input data signal is two-dimensional (see FIG. 14, "input image data").

9. Regarding **claim 4**, ONO further teaches that a predictor extracts higher frequency subbands that result from a first-level two-dimensional decomposition performed by the analysis filter bank from subbands obtained from higher levels of a two-dimensional decomposition performed by the analysis bank ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37, see FIG. 5).

10. Regarding **claim 5**, ONO further teaches that the two-dimensional decomposition is performed along one dimension first by processing the analysis filter bank as a separable transform (see FIG. 14, horizontal filtering is performed first).

11. Regarding **claim 6**, ONO further teaches that full decimation is performed prior to a predictor that extracts cross-subband dependence (see FIG. 2, full decimation occurs in the "Wavelet Conversion" step [see FIG. 14], which occurs before prediction).

12. Regarding **claim 7**, ONO further teaches that full decimation is performed prior to a predictor that extracts cross-subband dependence (see FIG. 2, full decimation occurs in the "Wavelet Conversion" step [see FIG. 14], which occurs before prediction).

13. Regarding **claim 20**, ONO teaches an encoder for encoding an input data signal comprising:

a multi-level analysis filter bank for decorrelating an input data signal (see FIG. 14, a filter bank for wavelet conversion);

a plurality of decimators for down sampling the filtered input data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data); and

a compressor including a quantizer (see FIG. 2, step 5-4) and coder (see FIG. 2, step 5-5) for reducing the amount of down sampled data from the second and higher levels of wavelet decomposition ("subband coefficient predicting unit 404 predicts a

coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

15. **Claims 21-27, 29, 30, and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono, Patent No.: US 5,883,978 ("ONO").

16. Regarding **claim 21**, ONO teaches all of the claimed limitations of claim 20.

However, ONO does not specifically disclose that the output of the compressor is transmitted to a receiver for decoding the compressed data signal.

An official notice is taken (see MPEP 2144.03) that the feature of transmitting the output of the compressor to a receiver for decoding the compressed data signal is well-known in the art.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to transmit the encoded data to a decoder in order to obtain decoded data.

17. Regarding **claim 22**, ONO teaches an encoder that mirrors the decoder of claim 22.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal (see the rejection of claim 1 above).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

18. Regarding **claim 23**, ONO teaches an encoder that mirrors the decoder of claim 23.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal, wherein the decoder comprises:

a de-compressor including an inverse quantizer (see FIG. 2, step 5-4, quantizing mirrors an inverse quantizer) and inverse coder (see FIG. 2, step 5-5, coding mirrors an inverse coder) for expanding the reduced amount of received data;

a plurality of interpolators for sampling compressed data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data which mirrors a plurality of interpolators);

a multilevel synthesis filter bank for performing an inverse wavelet transformation filter bank (see FIG. 14, a filter bank for wavelet conversion mirrors an inverse wavelet filter bank); and

a predictor for extracting cross-subband correlations ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

19. Regarding **claim 24**, ONO teaches all of the claimed limitations of claim 23.

However, ONO does not specifically disclose a means for conveying the recovered data signal.

An official notice is taken (see MPEP 2144.03) that the feature of conveying the recovered data signal is well-known in the art.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to convey the recovered data signal in order for a user to experience the data.

20. Regarding **claim 25**, ONO teaches an encoder that mirrors the decoder of claim 25.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal, wherein the decoder comprises:

a de-compressor including an inverse quantizer (see FIG. 2, step 5-4, quantizing mirrors an inverse quantizer) and inverse coder (see FIG. 2, step 5-5, coding mirrors an inverse coder) for expanding the reduced amount of received data;

a plurality of interpolators for upsampling a compressed data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data which mirrors a plurality of interpolators);

a multilevel synthesis filter bank for performing an inverse wavelet transformation filter bank (see FIG. 14, a filter bank for wavelet conversion mirrors an inverse wavelet filter bank); and

a predictor for extracting higher-frequency subbands corresponding to the first-level decomposition of an analysis wavelet filter bank ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

21. Regarding **claim 26**, ONO teaches all of the claimed limitations of claim 25.

However, ONO does not specifically disclose a means for conveying the recovered data signal.

An official notice is taken (see MPEP 2144.03) that the feature of conveying the recovered data signal is well-known in the art.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to convey the recovered data signal in order for a user to experience the data.

22. Regarding **claim 27**, ONO teaches an encoder that mirrors the decoder of claim 27.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal (see the rejection of claim 6 above).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

23. Regarding **claim 29**, ONO teaches an encoder that mirrors the decoder of claim 29.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal, wherein the decoder comprises:

a de-compressor including an inverse quantizer (see FIG. 2, step 5-4, quantizing mirrors an inverse quantizer) and inverse coder (see FIG. 2, step 5-5, coding mirrors an inverse coder) for expanding the reduced amount of received data;

a plurality of full interpolators for upsampling a compressed data signal prior synthesis filtering (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data which mirrors a plurality of interpolators);

a multilevel synthesis filter bank for performing an inverse wavelet transformation filter bank (see FIG. 14, a filter bank for wavelet conversion mirrors an inverse wavelet filter bank); and

a predictor for extracting cross-subband correlations ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

24. Regarding **claim 30**, ONO further teaches that the predictor extracts higher frequency subbands corresponding to the first-level decomposition of an analysis wavelet filter bank ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

25. Regarding **claim 33**, ONO teaches an encoding system for processing data signals comprising:

an encoder including:

a multi-level analysis filter band for decorrelating an input data signal (see FIG. 14, a filter bank for wavelet conversion);

a plurality of decimators for down sampling a filtered input data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data);

a quantizer (see FIG. 2, step 5-4) for processing only the subbands from the second and higher levels of wavelet decomposition ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37);

a coder (see FIG. 2, step 5-5) for compressing the subbands from the second and higher levels of wavelet decomposition ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37);

However, ONO does not specifically disclose a decoding system.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal, wherein the decoder includes:

an inverse quantizer for decompressing received subbands (see FIG. 2, step 5-4, quantizing mirrors an inverse quantizer);

an inverse coder for decompressing received subbands (see FIG. 2, step 5-5, coding mirrors an inverse coder);

a plurality of interpolators for upsampling the received compressed data signal (see FIG. 14, column 1, lines 51-53, the down arrows down sample the data which mirrors a plurality of interpolators);

a multi-level synthesis filter bank for performing an inverse wavelet transformation filter bank (see FIG. 14, a filter bank for wavelet conversion mirrors an inverse wavelet filter bank); and

a predictor for extracting the subbands from the first level decomposition that were not transmitted based on data of their spatially correlated subbands from other levels of decomposition ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

26. **Claims 8-19, 28, 31, and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono, Patent No.: US 5,883,978 ("ONO"), in view of Vaidyanathan, *Multirate Systems And Filterbanks* ("VAIDYANATHAN").

27. Regarding **claim 8**, ONO teaches all of the claimed limitations of claim 4.

However, ONO does not disclose that full decimation is performed after a predictor to minimize spatial location variance introduced by decimation.

In the same field of multirate systems, VAIDYANATHAN teaches that full decimation is performed after a predictor to minimize spatial location variance introduced by decimation (see VAIDYANATHAN, p. 119, FIG. 4.2-3, Identity 1, decimation is performed after a rational function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO after a rational function as taught by VAIDYANATHAN in order to improve the implementation of the multirate system (see VAIDYANATHAN, p. 119).

28. Regarding **claim 9**, ONO teaches all of the claimed limitations of claim 4.

However, ONO does not disclose that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation.

In the same field of multirate systems, VAIDYANATHAN teaches that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO before and after

function as taught by VAIDYANATHAN in order to make the system more efficient (see VAIDYANATHAN, p. 134, section 4.4).

29. Regarding **claim 10**, ONO teaches all of the claimed limitations of claim 5.

However, ONO does not disclose that full decimation is performed after a predictor to minimize spatial location variance introduced by decimation.

In the same field of multirate systems, VAIDYANATHAN teaches that full decimation is performed after a predictor to minimize spatial location variance introduced by decimation (see VAIDYANATHAN, p. 119, FIG. 4.2-3, Identity 1, decimation is performed after a rational function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO after a rational function as taught by VAIDYANATHAN in order to improve the implementation of the multirate system (see VAIDYANATHAN, p. 119).

30. Regarding **claim 11**, ONO teaches all of the claimed limitations of claim 5.

However, ONO does not disclose that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation.

In the same field of multirate systems, VAIDYANATHAN teaches that partial decimation is performed after both the analysis filter and the predictor for reducing the

number of computations by the analysis filter and decimation (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO before and after function as taught by VAIDYANATHAN in order to make the system more efficient (see VAIDYANATHAN, p. 134, section 4.4).

31. Regarding **claim 12**, ONO teaches an encoder for encoding an input data signal comprising:

an multi-level analysis filter bank for decimating an input data signal (see ONO, FIG. 14, a filter bank for wavelet conversion);

a plurality of decimators for down sampling the filtered input data signal (see ONO, FIG. 14, column 1, lines 51-53, the down arrows down sample the data); and

a predictor for extracting cross-subband dependence ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", ONO, column 6, lines 35-37).

However ONO does not specifically disclose that the second and higher-ordered levels of the filter bank are finite impulse response filters with fewer elements than those in the first-level FIR filter bank.

In the same field of multirate systems, VAIDYANATHAN teaches that the second and higher-ordered levels of the filter bank are finite impulse response filters ("filters H(z) and G(z) are FIR", VAIDYANATHAN, p. 500, comment 2) with fewer elements than

those in the first-level FIR filter bank (see VAIDYANATHAN, p. 535, order estimation, the order of the FIR filter is inversely proportional to bandwidth, therefore since the first level filter bank has the smallest bandwidth [see FIG. 11.3-8], it has the largest filter order).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the FIR filters of VAIDYANATHAN with the encoder of ONO so that the basis functions are finite in length (see VAIDYANATHAN, p. 500, comment 2).

32. Regarding **claim 13**, ONO further teaches that a predictor extracts higher frequency subbands resulting from a first-level two-dimensional decomposition performed by the analysis filter bank from subbands obtained from higher levels of a two-dimensional decomposition performed by the analysis bank ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", ONO, column 6, lines 35-37, see FIG. 5).

33. Regarding **claim 14**, ONO further teaches that the two-dimensional decomposition is performed by processing the analysis bank as a separable transform (see ONO, FIG. 2, wavelet conversion is performed in a separate step).

34. Regarding **claim 15**, ONO further teaches that full decimation is performed prior to the (see ONO, FIG. 2, full decimation occurs in the "Wavelet Conversion" step [see FIG. 14], which occurs before prediction).

35. Regarding **claim 16**, ONO and VAIDYANATHAN teach all of the claimed limitations of claim 13.

However, ONO and the above embodiment of VAIDYANATHAN do not disclose that full decimation is performed after the predictor to minimize spatial location variance introduced by decimation.

In the same field of multirate systems, another embodiment of VAIDYANATHAN teaches that full decimation is performed after the predictor to minimize spatial location variance introduced by decimation (see VAIDYANATHAN, p. 119, FIG. 4.2-3, Identity 1, decimation is performed after a rational function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO after a rational function as taught by VAIDYANATHAN in order to improve the implementation of the multirate system (see VAIDYANATHAN, p. 119).

36. Regarding **claim 17**, ONO and VAIDYANATHAN teach all of the claimed limitations of claim 13.

However, ONO and the above embodiment of VAIDYANATHAN do not disclose that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation.

In the same field of multirate systems, another embodiment VAIDYANATHAN teaches that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO before and after function as taught by VAIDYANATHAN in order to make the system more efficient (see VAIDYANATHAN, p. 134, section 4.4).

37. Regarding **claim 18**, ONO and VAIDYANATHAN teach all of the claimed limitations of claim 14.

However, ONO and the above embodiment of VAIDYANATHAN do not disclose that full decimation is performed after the predictor to minimize spatial location variance introduced by decimation.

In the same field of multirate systems, another embodiment of VAIDYANATHAN teaches that full decimation is performed after the predictor to minimize spatial location variance introduced by decimation (see VAIDYANATHAN, p. 119, FIG. 4.2-3, Identity 1, decimation is performed after a rational function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO after a rational function as taught by VAIDYANATHAN in order to improve the implementation of the multirate system (see VAIDYANATHAN, p. 119).

38. Regarding **claim 19**, ONO and VAIDYANATHAN teach all of the claimed limitations of claim 14.

However, ONO and the above embodiment of VAIDYANATHAN do not disclose that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation.

In the same field of multirate systems, another embodiment VAIDYANATHAN teaches that partial decimation is performed after both the analysis filter and the predictor for reducing the number of computations by the analysis filter and decimation (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform the decimation of ONO before and after function as taught by VAIDYANATHAN in order to make the system more efficient (see VAIDYANATHAN, p. 134, section 4.4).

39. Regarding **claim 28**, ONO and VAIDYANATHAN teach an encoder that mirrors the decoder of claim 28.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal (see the rejection of claim 9 above).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO and VAIDYANATHAN to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

40. Regarding **claim 31**, ONO and VAIDYANATHAN teach an encoder that mirrors the decoder of claim 31.

An official notice is taken (see MPEP 2144.03) that it is well-known in the art to decode a signal by performing the opposite steps used to encode the signal, wherein the decoder comprises:

a de-compressor including an inverse quantizer (see FIG. 2, step 5-4, quantizing mirrors an inverse quantizer) and inverse coder (see FIG. 2, step 5-5, coding mirrors an inverse coder) for expanding the reduced amount of received data;

a plurality of partial interpolators for partially upsampling a compressed data signal prior synthesis filtering (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function, which mirrors upsampling);

a multilevel synthesis filter bank for performing an inverse wavelet transformation filter bank (see FIG. 14, a filter bank for wavelet conversion mirrors an inverse wavelet filter bank); and

a predictor for extracting cross-subband correlations ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37), and

a plurality of partial interpolators for partially upsampling the extracted data from the predictor (see VAIDYANATHAN, p. 140, FIG. 4.4-5(b), decimation is performed in two stages, before and after a function, which mirrors upsampling).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify ONO and VAIDYANATHAN to decode the signal by reversing the steps used to encode the signal in order to obtain decoded data.

41. Regarding **claim 32**, ONO further teaches that the predictor extracts higher frequency subbands corresponding to the first-level decomposition of an analysis wavelet filter bank ("subband coefficient predicting unit 404 predicts a coefficient of a subband which is higher than a low-frequency subband", column 6, lines 35-37).

Conclusion

42. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. A list of the pertinent prior art can be found on the included form PTO-892 Notice of References Cited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel Stoffregen whose telephone number is (571) 270-

1454. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER